VEI-30 Dinion Infrared Imager

VEI-Series

BOSCH

en Installation Manual

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1 Safety

1.1 Safety precautions

DANGER!
High risk: This symbol indicates an imminently hazardous situation such as “Dangerous Voltage” inside the product.
If not avoided, this will result in an electrical shock, serious bodily injury, or death.

WARNING!
Medium risk: Indicates a potentially hazardous situation.
If not avoided, this could result in minor or moderate bodily injury.

CAUTION!
Low risk: Indicates a potentially hazardous situation.
If not avoided, this could result in property damage or risk of damage to the unit.

1.2 Important notices

Accessories - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury and/or serious damage to the unit. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer. When a cart is used, use caution and care when moving the cart/apparatus combination to avoid injury from tip-over. Quick stops, excessive force, or uneven surfaces may cause the cart/unit combination to overturn. Mount the unit per the manufacturer's instructions.

All-pole power switch - Incorporate an all-pole power switch, with a contact separation of at least 3 mm in each pole, into the electrical installation of the building. If it is needed to open the housing for servicing and/or other activities, use this all-pole switch as the main disconnect device for switching off the voltage to the unit.

Camera grounding - For mounting the camera in potentially damp environments, ensure to ground the system using the ground connection of the power supply connector (see section: Connecting external power supply).

Camera lens - An assembled camera lens in the outdoor housing must comply and be tested in accordance with *UL/IEC60950*. Any output or signal lines from the camera must be SELV or Limited Power Source. For safety reasons the environmental specification of the camera lens assembly must be within the environmental specification of -10 °C to 50 °C (14 °F to 122 °F).

Camera signal - Protect the cable with a primary protector if the camera signal is beyond 140 feet, in accordance with *NEC800 (CEC Section 60)*.

CAUTION!
CLASS 1 LED PRODUCT
IEC60825-1 Ed. 1.2 (2001)

Coax grounding:

- Ground the cable system if connecting an outside cable system to the unit.
- Connect outdoor equipment to the unit's inputs only after this unit has had its grounding plug connected to a grounded outlet or its ground terminal is properly connected to a ground source.
- Disconnect the unit's input connectors from outdoor equipment before disconnecting the grounding plug or grounding terminal.
- Follow proper safety precautions such as grounding for any outdoor device connected to this unit.

U.S.A. models only - *Section 810* of the *National Electrical Code, ANSI/NFPA No.70*, provides information regarding proper grounding of the mount and supporting structure, grounding of the coax to a discharge unit, size of grounding conductors, location of discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

Disposal - Your Bosch product was developed and manufactured with high-quality material and components that can be recycled and reused. This symbol means that electronic and electrical appliances, which have reached the end of their working life, must be collected and disposed of separately from household waste material. Separate collecting systems are usually in place for disused electronic and electrical products. Please dispose of these units at an environmentally compatible recycling facility, per *European Directive 2002/96/EC*.

Electronic Surveillance - This device is intended for use in public areas only. U.S. federal law strictly prohibits surreptitious recording of oral communications.

Environmental statement - Bosch has a strong commitment towards the environment. This unit has been designed to respect the environment as much as possible.

Electrostatic-sensitive device - Use proper CMOS/MOS-FET handling precautions to avoid electrostatic discharge.

NOTE: Wear required grounded wrist straps and observe proper ESD safety precautions when handling the electrostatic-sensitive printed circuit boards.

Fuse rating - For protection of the device, the branch circuit protection must be secured with a maximum fuse rating of 16A. This must be in accordance with *NEC800 (CEC Section 60)*.

Grounding and polarization - This unit may be equipped with a polarized alternating current line plug (a plug with one blade wider than the other blade). This safety feature allows the plug to fit into the power outlet in only one way. If unable to insert the plug fully into the outlet, contact a locally certified electrician to replace the obsolete outlet. Do not defeat the safety purpose of the polarized plug.

Alternately, this unit may be equipped with a 3-pole grounding plug (a plug with a third pin for earth grounding). This safety feature allows the plug to fit into a grounded power outlet only. If unable to insert the plug into the outlet, contact a locally certified electrician to replace the obsolete outlet. Do not defeat the safety purpose of the grounding plug.

Moving - Disconnect the power before moving the unit. Move the unit with care. Excessive force or shock may damage the unit and the hard disk drives.

Outdoor signals - The installation for outdoor signals, especially regarding clearance from power and lightning conductors and transient protection, must be in accordance with *NEC725* and *NEC800 (CEC Rule 16-224* and *CEC Section 60)*.

Permanently connected equipment - Incorporate a readily accessible disconnect device external to the equipment.

Pluggable equipment - Install the socket outlet near the equipment so it is easily accessible.

Power resupply - If the unit is forced to power down due to exceeding the specified operating temperatures, disconnect the power cord, wait for at least 30 seconds, and then reconnect the power cord.

Power lines - Do not locate the camera near overhead power lines, power circuits, or electrical lights, nor where it may contact such power lines, circuits, or lights.
SELV - All the input/output ports are Safety Extra Low Voltage (SELV) circuits. SELV circuits should only be connected to other SELV circuits.
Because the ISDN circuits are treated like telephone-network voltage, avoid connecting the SELV circuit to the Telephone Network Voltage (TNV) circuits.

System ground/Safety ground

System (video) ground is indicated by the symbol .

Safety (power) ground is indicated by the symbol .

The system ground is only used to comply with safety standards or installation practices in certain countries. Bosch does **not** recommend connecting system ground to safety ground unless it is explicitly required. However, if the system ground and safety ground are connected and grounding loops are causing interference in the video signal, use an isolation transformer (available separately from Bosch).

CAUTION!
Connecting System ground to Safety ground may result in ground loops that can disrupt the CCTV system.

Video loss - Video loss is inherent to digital video recording; therefore, Bosch Security Systems cannot be held liable for any damage that results from missing video information. To minimize the risk of lost digital information, Bosch Security Systems recommends multiple, redundant recording systems, and a procedure to back up all analog and digital information.

1.3 FCC & ICES compliance

FCC Information

(U.S.A. and Canadian Models Only)

This equipment has been tested and found to comply with the limits for a **Class B** digital device, pursuant to *part 15* of the *FCC Rules*. These limits are designed to provide reasonable protection against harmful interference in a **residential installation**. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna;
- increase the separation between the equipment and receiver;
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected;
- consult the dealer or an experienced radio/TV technician for help.

Intentional or unintentional modifications, not expressly approved by the party responsible for compliance, shall not be made. Any such modifications could void the user's authority to operate the equipment. If necessary, the user should consult the dealer or an experienced radio/television technician for corrective action.

The user may find the following booklet, prepared by the Federal Communications Commission, helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Informations FCC et ICES

(modèles utilisés aux États-Unis et au Canada uniquement)

Suite à différents tests, cet appareil s'est révélé conforme aux exigences imposées aux appareils numériques de **classe B**, en vertu de la *section 15 du règlement* de la *Commission fédérale des communications des États-Unis (FCC)*, et en vertu de la norme *ICES-003 d'Industrie Canada*. Ces exigences visent à fournir une protection raisonnable contre les interférences nuisibles lorsque l'appareil est utilisé dans le cadre d'une **installation résidentielle**. Cet appareil génère, utilise et émet de l'énergie de radiofréquences et peut, en cas d'installation ou d'utilisation non conforme aux instructions, engendrer des interférences nuisibles au niveau des radiocommunications. Toutefois, rien ne garantit l'absence d'interférences dans une installation particulière. Il est possible de déterminer la production d'interférences en mettant l'appareil successivement hors et sous tension, tout en contrôlant la réception radio ou télévision. L'utilisateur peut parvenir à éliminer les interférences éventuelles en prenant une ou plusieurs des mesures suivantes:

- Modifier l'orientation ou l'emplacement de l'antenne réceptrice;
- Éloigner l'appareil du récepteur;
- Brancher l'appareil sur une prise située sur un circuit différent de celui du récepteur;
- Consulter le revendeur ou un technicien qualifié en radio/télévision pour obtenir de l'aide.

Toute modification apportée au produit, non expressément approuvée par la partie responsable de l'appareil, est strictement interdite. Une telle modification est susceptible d'entraîner la révocation du droit d'utilisation de l'appareil.

La brochure suivante, publiée par la Commission fédérale des communications (FCC), peut s'avérer utile : *How to Identify and Resolve Radio-TV Interference Problems (Comment identifier*

et résoudre les problèmes d'interférences de radio et de télévision). Cette brochure est disponible auprès du U.S. Government Printing Office, Washington, DC 20402, États-Unis, sous la référence n° 004-000-00345-4.

NOTICE!
This is a class B product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

1.4 CSA certification

Disclaimer
CSA has not tested the performance or reliability of the security or signaling aspects of this product. CSA has only tested fire, shock and/or casualty hazards as outlined in CSA's *Standard(s) for Safety for Closed Circuit Television Equipment, UL 2044*. CSA Certification does not cover the performance or reliability of the security or signaling aspects of this product. CSA MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING RELATED FUNCTIONS OF THIS PRODUCT.

Disclaimer
CSA has not tested the performance or reliability of the security or signaling aspects of this product. CSA has only tested fire, shock and/or casualty hazards as outlined in CSA's *Standard(s) for Safety for Information Technology Equipment, UL 60950-1*. CSA Certification does not cover the performance or reliability of the security or signaling aspects of this product.
CSA MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING-RELATED FUNCTIONS OF THIS PRODUCT.

1.5 Bosch notices

Copyright
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Trademarks
All hardware and software product names used in this document are likely to be registered trademarks and must be treated accordingly.

NOTE:
This manual has been compiled with great care and the information it contains has been thoroughly verified. The text was complete and correct at the time of printing. The ongoing development of the products may mean that the content of the user guide can change without notice. Bosch Security Systems accepts no liability for damage resulting directly or indirectly from faults, incompleteness or discrepancies between the user guide and the product described.

More information
For more information, please contact the nearest Bosch Security Systems location or visit*www.boschsecurity.com*

2 Description

The VEI-30 IR Imager is a high-performance, CCD-based day/night analog camera and built-in infrared illuminator, with outdoor, all-weather housing and bracketry (rated to IP67).

The VEI-30 is easy to install and ready to use, and offers the best solution for demanding scene conditions. Features include:

- True Day/Night performance with switchable IR filter and Auto Photocell switching mode
- Illuminator with variable field illumination
- Progressive scan
- 540 TVL resolution
- Dynamic engine with Smart BLC
- Privacy masks
- Bilinx (bi-directional coaxial communication)
- Wide operating temperature range (–40°C to +50°C / –40°F to +122°F)
- Six pre-programmed operation modes
- Adaptive dynamic noise reduction
- Multiple language on-screen display

2.1 Unpacking

This electronic equipment should be unpacked and handled carefully. If an item appears to have been damaged in shipment, notify the shipper immediately.
Verify that all the parts listed in the Parts List below are included. If any items are missing, notify your Bosch Security Systems Sales or Customer Service Representative.
The original packing carton is the safest container in which to transport the unit and must be used if returning the unit for service. Save it for possible future use.

2.2 Parts List

2.2.1 Parts Included with the Product

Quantity	Item
1	VEI-30 IR Imager camera
1	Cable-managed pan/tilt bracket
1	Junction box
1	Sunshield
1	3D Diffuser
1	Hex key set (consisting of 1x 5 mm hex key; 1x 4 mm hex key
1	Corner mount kit (optional)
1	Mast mount kit (optional)
1	Quick Install Guide

2.2.2 User-supplied Parts

Quantity	Item
4	Lag bolts, 1/4-9 x 2 (M7-0.35 x 50) with 1/2 in. head
4	1/2 in. (12 mm) washers
2	3/4 in. (20 mm) NPS watertight pipe fittings OR 1/2 in. (15 mm) NPS watertight pipe fittings

3 Planning

CAUTION!
CLASS 1 LED PRODUCT
IEC60825-1 Ed. 1.2 (2001)

WARNING!
IMPORTANT MOUNTING INSTRUCTIONS
This apparatus must be securely attached to the wall in accordance with these installation instructions. Failure to follow installation instructions may result in injury or death.

CAUTION!
Ensure that the selected location is protected from falling objects, accidental contact with moving objects, and unintentional interference from personnel. Follow all applicable building codes.

Select a suitable location that protects the camera from accidental damage, tampering and environmental conditions exceeding the specifications of the camera.

Follow these mounting guidelines:

1. Locate the camera such that it cannot be easily interfered with, either intentionally or accidentally.
2. Select a **smooth, flat mounting surface** to ensure proper sealing. The surface must also support the combined weight of the camera and mounting hardware under all expected conditions of vibration and temperature. Recommended mounting height is at least 4 m (13 ft); however, optimal conditions will vary with the specific installation environment.

3.1 Hardware Requirements

Tools Required

- 1x 5 mm (3/16) hex key; 1x 4 mm (5/32) hex key (supplied)
- Small, straight-blade screwdriver - 2.5 mm (0.1 in.)
- Socket wrench and 9/16 in. (14 mm) socket
- Drill and 7/32 in. (5.5mm) drill bit

Hardware Requirements

- VEI-30 or NEI-30 junction box
- Four (4) lag bolts, 1/4-9 x 2 (M7-0.35 x 50) with 1/2 in. head (not supplied)
- Four (4) 1/2 in. (12 mm) washers (not supplied)
- Two (2) 3/4 in. (20 mm) NPS watertight pipe fittings OR 1/2 in. (15 mm) NPS watertight pipe fittings (not supplied)

3.2 Pre-installation Checklist

WARNING!
This installation must be made by a qualified service person and must conform to all local codes.

WARNING!
CSA Certified / UL Listed CLASS 2 power adaptors must be used in order to comply with electrical safety standards.

1. Determine the location and distance for the junction box based on its voltage and current consumption.
   See *Section 5 Connection, page 16*, for wiring information and distances.
2. Use only UL-listed liquid tight strain reliefs for conduits to the junction box to ensure that water cannot enter the box. You must use 3/4 in. (20 mm) NPS watertight conduits and fittings (to meet NEMA 4X standards).

WARNING!
Power and I/O cabling must be routed separately inside different permanently earthed metal conduits.

3. Route all rough wiring including: power, control, video coax, alarms I/O, relay I/O, and fiber optic cabling. See *Section 5 Connection, page 16*, for video and control protocol methods.

WARNING!
Install external interconnecting cables in accordance with NEC, ANSI/NFPA70 (for US application) and Canadian Electrical Code, Part I, CSA C22.1 (for CAN application) and in accordance with local country codes for all other countries.
CSA Certified / UL Listed CLASS 2 power adaptors must be used in order to comply with electrical safety standards.
Branch circuit protection incorporating a 20 A, 2-pole Listed Circuit Breaker or Branch Rated Fuses are required as part of the building installation. A readily-accessible 2-pole disconnect device with a contact separation of at least 3 mm must be incorporated.

4. Select the appropriate mounting kit to use, depending on the location of the VEI-30 / NEI-30 Series camera. The camera is intended to be mounted securely to a wall using the mounting holes in the junction box.

CAUTION!
Select a rigid mounting location to prevent excessive vibration to the camera.

4 Installation

This chapter details how to mount the VEI-30 / NEI-30 to a wall. Any variations to the installation procedures are noted.

4.1 Mount the Junction Box

Before mounting the junction box, decide if you should wire the box through the holes in the bottom or back of the box. If wiring the box through the back, move the two (2) seal plugs to the bottom through-holes before mounting. This installation must be made by a qualified service person and must conform to all local codes.

NOTICE!
Use 3/4 in. (20 mm) NPS fittings for the holes on the bottom and back of the box. Use 1/2 in. (15 mm) NPS fittings for the side holes.

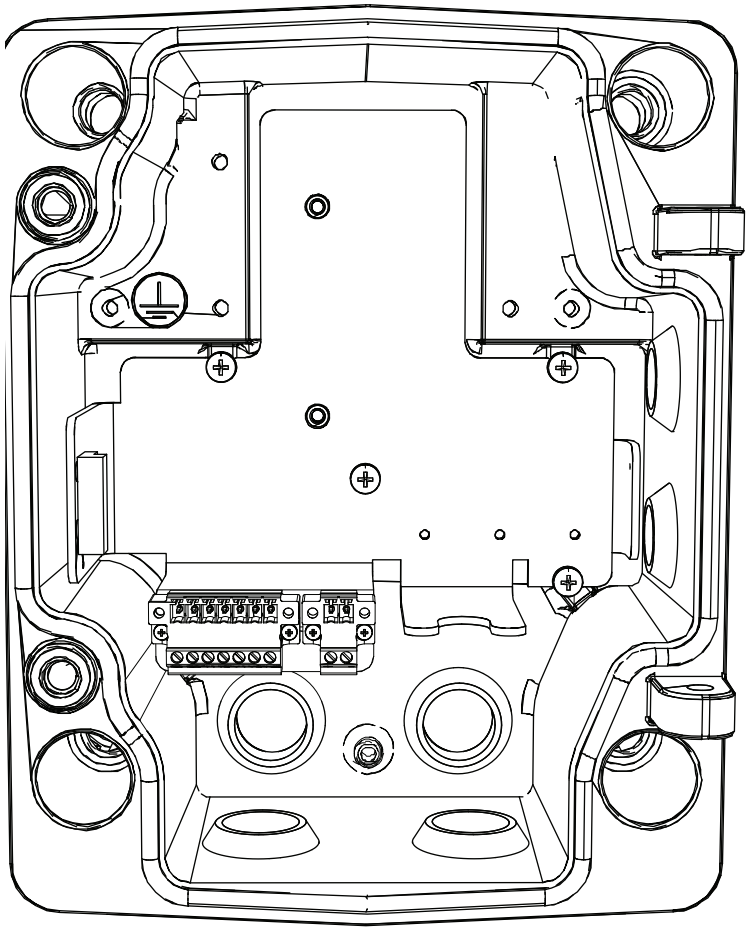

Figure 4.1 Junction Box Wall Mount

WARNING!
The camera has been evaluated for wall mounting using the following hardware secured into a 2 x 4 stud under 1/2 in. drywall:
– Four (4) Lag bolts, 1/4-9 x 2 (M7-0.35 x 50) with 1/2 in. head
– Four (4) 1/2 in. (12 mm) flat washers

1. Locate a stud in the wall and mark the outside edges of the stud.
2. Using the wall mount bracket as a template, align the mounting hole with the center of the stud.
3. Mark the point on the wall in the center of the hole where the mounting bolt will be positioned.
4. Remove the wall mount bracket and drill a pilot hole at the marked point.
5. Align the wall mount bracket mounting hole with the hole drilled in the wall.
6. Using a 9/16 in. (14 mm) socket and driver, secure the wall mount bracket by screwing the 1/4-9 x 2 (M7-0.35 x 50) lag bolt with 1/2 in. (12 mm) washer securely into the stud.
7. Follow this procedure to attach the three remaining lag bolts.
8. Attach 3/4 in. (20 mm) NPS watertight pipe fittings (not supplied) to the bottom or back holes of the junction box through which you will run the power, video, and control data wires.

NOTICE!
The camera has not been evaluated for safety requirements using other mounting kits.

4.2 Route Wires and Attach Connectors

Power wires must be routed to the right (front) side of the junction box through a separate conduit. All video, control, and alarm wires must be routed through a second conduit to the left side of the box.

WARNING!
External interconnecting cables are to be installed in accordance with NEC, ANSI/NFPA70 (for US application) and Canadian Electrical Code, Part I, CSA C22.1 (for CAN application) and in accordance with local country codes for all other countries.

1. Route all video, control, and alarm wires through the conduit fitting on the left side of the junction box. See *Section 5 Connection, page 16* for coax, UTP, and fiber optic specifications and distances.
2. Route the 24 VAC / 12 VDC lines through the conduit fitting on the right side of the box.
3. Cut and trim all wires with sufficient slack to reach their connector terminals in the box, but not so long as to be pinched. See *Figure 4.2, Page 15*, above, for the connector locations.
4. Attach the supplied 2-pin Power Plug to the incoming power wires.
5. Attach the supplied 7-pin relay output plug to the incoming relay wires.
6. Attach a BNC connector to the incoming video coax cable. If using UTP for video or installing an Ethernet model, attach an RJ45 plug to the incoming UTP cable. If installing a Fiber Optic model, attach an ST fiber plug to the fiber optic cable. See *Section 5 Connection, page 16*, for the different methods of transmitting video and for wire specifications.

4.3 Attach Pendant Arm to Junction Box

The bottom hinge pin of the Camera Arm is provided with a Hinge Pin Stop to hold the hinge open while attaching the arm to the junction box.

1. Compress the bottom hinge pin by pushing the pin lever downward and rotating it behind the Hinge Pin Stop.

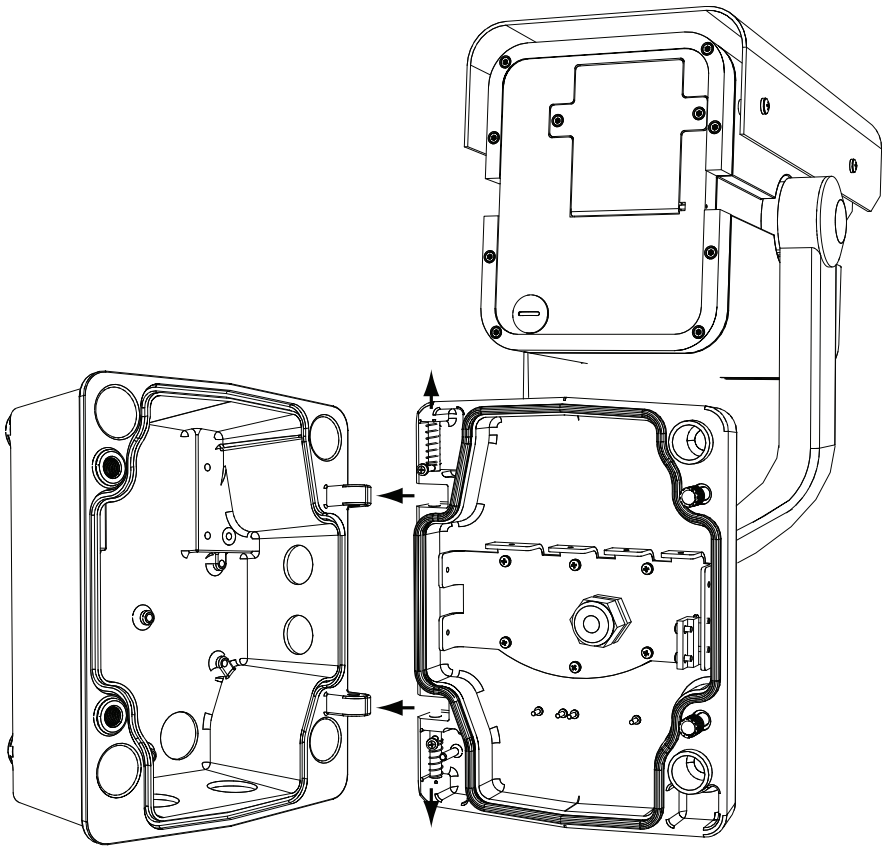

Figure 4.2 Camera Box Hinge Alignment

2. Open the top hinge by pushing its pin lever up and holding it.

NOTICE!
Both Hinge Pins must be fully compressed to open (unlock) the hinges of the Camera Arm and before proceeding to the next step.

3. While continuing to hold the top hinge pin, open and align the top and bottom hinges of the Camera Arm to their mating points on the junction box. See *Figure 4.2*, above, for an illustration.
4. Once you have aligned the hinges, release the top hinge pin to engage its mating hinge on the junction box. Then release the bottom hinge pin from the Hinge Pin Stop to lock the Camera Arm to the junction box.

WARNING!
Serious injury or death can occur if the hinge pins of the Camera Arm are not fully engaged (locked) to the junction box. Exercise caution before releasing the Camera Arm.

5 Connection

5.1 Power Connection

Connect power from a 12 VDC or 24 VAC class 2 power supply as follows:

– Use AWG 16 to 22 stranded wire or AWG 16 to 26 solid wire; cut back 5 mm (0.2 in.) of insulation.
– Loosen the screws of the supplied 2-pole connector and insert the wires.
– Tighten the screws and insert the 2-pole connector into the power socket of the camera.

If the input voltage is not within the required range, the voltage indicator LED (on the front face) will flash.

NOTICE!

For a **DC supply**, the polarity is important. Incorrect polarity does not damage the camera, but will not allow the camera to switch on. If input voltage is not within the specified range or has incorrect polarity (DC only), a yellow LED indicator in the front window pulses to indicate this condition.

5.2 Video and Control Cables

Coaxial Cable

Coaxial cable terminated with BNC connectors is the most common method for transmitting composite video. Bilinx control data can also be sent over the same cable. Bilinx is a Bosch 2-way communication protocol that allows remote control, configuration, and updates over a video coax cable. Bilinx is available on all analog models.

VEI-30 models feature cable compensation or “Pre-Comp,” which extends the range of video from the head end, but does not extend the range of Bilinx control (n/a on NEI-30 models).

Cable Compensation	**Maximum Distances**		
	Video Only		**Bilinx Control**
Cable Type	Pre-comp OFF	Pre-comp ON	Pre-comp ON or OFF
RG-59/U	300 m (1000 ft)	600 m (2000 ft)	300 m (1000 ft)
RG-6/U	450 m (1500 ft)	900 m (3000 ft)	450 m (1500 ft)
RG-11/U	600 m (2000 ft)	1200 m (4000 ft)	600 m (2000 ft)
Size	O.D. between 4.6 mm to 7.9 mm (0.181 in. to 0.312 in.)		
Shield	Copper braid: 95%		
Central Conductor	Standard copper center		
Terminal Connector	BNC		

5.3 Alarm Output Connections

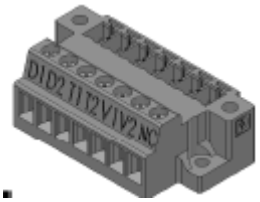

Figure 5.1 Terminal Block for Alarm Output Connections

#	Label	Description	Wire Color	Connects To...
1	D1	Illuminator on alarm output connection 1	Black	Pin 1 of terminal block CN10 on single channel
2	D2	Illuminator on alarm output connection 2 Voltage free and either open (Illuminator off mode) or closed (Illuminator on mode)	Orange	Pin 2 of terminal block CN10 on single channel
3	T1	Tamper alarm output connection 1	Brown	Pin 1 of terminal block CN11 on single channel
4	T2	Tamper alarm output connection 2 Voltage free and either open or closed (normally closed)	Gray	Pin 2 of terminal block Cn11 on single channel
5	V1	Camera alarm output connection 1	White	Pin 6 of terminal block X453 on processor PCBA
6	V2	Camera alarm output connection 2	Yellow	Pin 3 of terminal block X453 on processor PCBA
7	NC	Not connected	(not connected)	

6 Configuration

All VEI-30 camera settings (except lens focus, focal length, and LED tilt) can be adjusted remotely using the Configuration Tool for Imaging Devices (CTFID) software application. Refer to the *Configuration Tool for Imaging Devices User Manual* located on the Bosch Security Systems website (www.boschsecurity.com).

To adjust the focal length, focus, and the LED tilt, use the controls located on the access panel on the rear of the camera housing. An access panel also contains the camera keypad buttons that you use to interact with the camera's on-screen display (OSD) menu. This menu provides advanced set-up options for getting the best results under special circumstances.

6.1 Accessing the Controls

1. Unscrew the two (2) captive screws (item 1, below) of the access panel on the rear of the camera housing.
2. Remove the sealing plug on the bottom left corner.

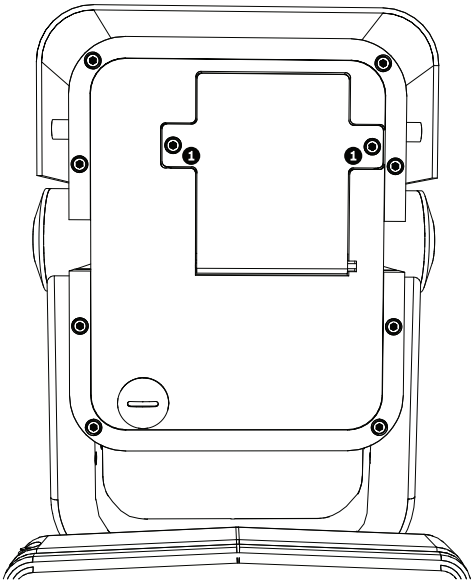

Figure 6.1 Rear camera housing with access panel

3. Open the access panel. Now you can adjust the focus, focal length, and LED tilt controls (see *Figure 6.2* below).

   Note: Before you make any adjustments, you may need to connect the camera to a monitor to view the changes to the picture. See *Section 5 Connection, page 16* for details. Refer to the complete installation manual (on CD) for details about advanced camera setup using the keypad controls.

NOTICE!
Remember to replace the sealing plug and tighten the captive screws on the panel when you finish the adjustments.

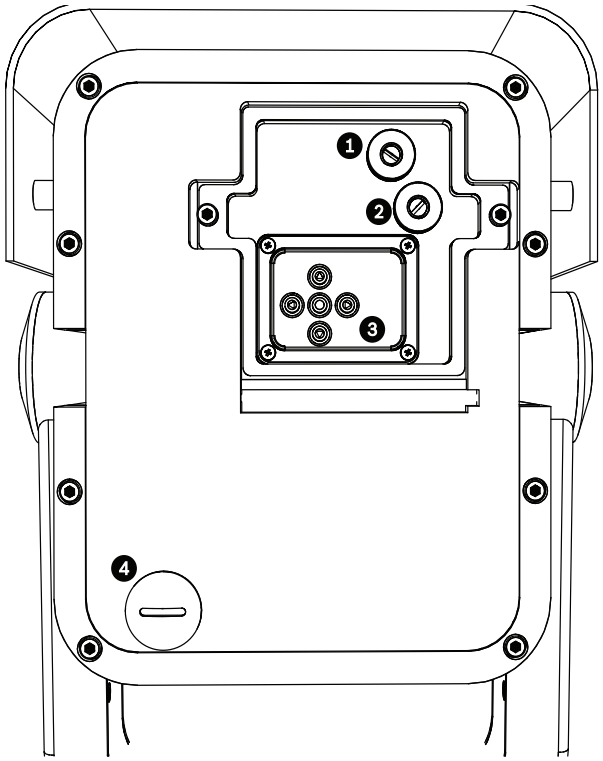

Figure 6.2 Camera and LED

1	Focal length adjustment
2	Focus adjustment (zoom)
3	Advanced camera setup controls - keypad
4	LED tilt control

6.2 Adjusting the Focus and Focal Length

1. Use the top set screw (item 1, *Figure 6.2*) to adjust the image focus:
   - Turn the set screw to the left to focus toward (**N**) (near) (zoom in).
   - Turn the set screw to the right to focus toward (**F**) (far) (zoom out).
2. Use the lower set screw (item 2, *Figure 6.2*) to adjust the focal length (tight or wide):
   - Turn the set screw to the left for a wider focal length
   - Turn the set screw to the right for a telephoto (tight) focal length.

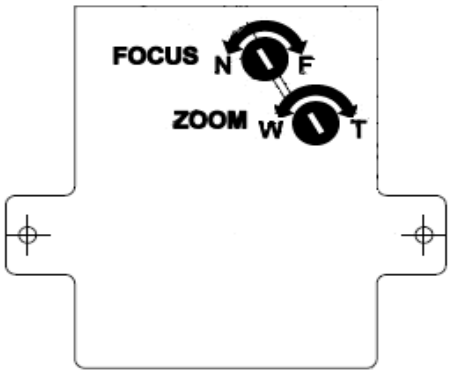

Figure 6.3 Focus and Zoom graphic on the inside of the access panel on the rear of the camera housing.

6.3 Making Pan Adjustments

1. Using the 4 mm hex key, loosen the bolts at the base of the “u bracket” to make the necessary pan adjustments.
2. When loosened, adjust the camera to the desired pan angle.
3. Tighten the bolt to secure in place.

6.4 Making Tilt Adjustments

1. Unscrew the round caps (CCW) where the bracket attaches to the camera housing to expose the bolts for tilt adjustment.
2. Using the 4 mm hex key, loosen the bolts and make the necessary tilt adjustments.
3. Tighten the bolts to secure the camera in place.
4. Replace the round caps when you finish the adjustments.

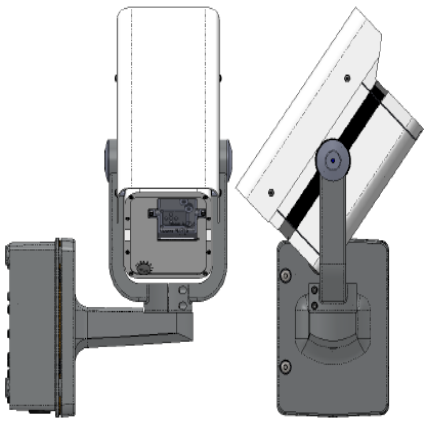

Figure 6.4 Example orientation: Camera rotated 90 degrees left, pointing up 50 degrees

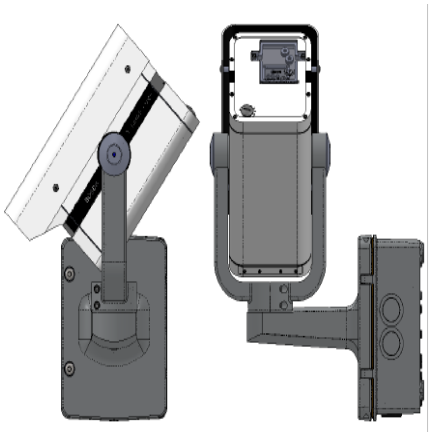

Figure 6.5 Example orientation: Camera rotated 90 degrees right, pointing down 50 degrees

6.5 Adjusting the Variable Field Illumination

6.5.1 Adjusting the LED Tilt Angle

You can orient the LED array tilted either up or down to maximize infrared coverage over the field of view. On the rear of the camera housing is graphic for the LED tilt.

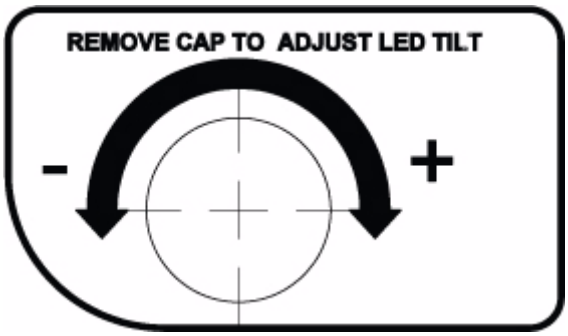

Figure 6.6 LED tilt scale

The “+” symbol indicates adjusting the LED tilt angle above the camera axis; and the “-” symbol indicates adjusting the LED tilt angle below the camera axis.

As a general guideline, when the camera is pointed at a steeper angle down (usually at higher installation heights or for shorter range applications), the LED tilt angle should be raised above the camera axis to reduce the potential of overexposure in the foreground.

6.5.2 Adjusting the Illumination Beam Width

You can adjust the infrared beam width by adding or removing the 3D diffuser. The 3D diffuser is recommended for wider field of view applications. With the 3D diffuser, a focal length of 6 mm provides a horizontal field of view of 43° to match the illumination pattern; the resulting beam angle is 43° (H) x 10° (V). Without the 3D diffuser, a focal length of 27 mm (or greater) provides a horizontal field of view of 10° (or less) to match the illumination pattern; the resulting beam angle is 10° (H) x 10° (V). Each camera ships a 3D diffuser plate (already installed in the camera.) and the 3D diffuser (not installed in the camera). When inserted, the 3D diffuser will be held in place by the diffuser plate.

To install the 3D diffuser:

1. Unscrew the four (4) captive screws beneath the illuminator in the front of the unit (circled in *Figure 6.7*, below).

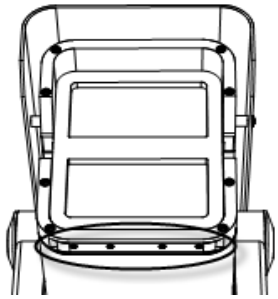

Figure 6.7 3D Diffuser (area circled)

2. Using the captive screws, remove the 3D diffuser plate.
3. Insert the 3D diffuser into the slit in the gasket on the 3D diffuser plate.
   IMPORTANT: Ensure that the diffuser is inserted into the camera housing with the sticker side facing the LED array. It is important that the diffuser is oriented with the sticker side surface facing the LED array or IR performance will be lost.
4. Install the diffuser and plate assembly into the camera housing to secure and seal the unit.

To remove the 3D diffuser:

1. Remove the 3D diffuser and plate assembly as when installing the 3D diffuser.
2. Remove the 3D diffuser from the diffuser plate.
3. Install the diffuser plate into the camera housing to secure and seal the unit.

7 Operation

The camera normally provides an optimal picture without the need for further adjustments. Advanced set-up options are available in a menu system for getting the best results under special circumstances. The camera implements your changes immediately so that before and after settings are easily compared.

7.1 Menus

7.1.1 Top level menus

Once you have opened the access panel on the rear of the camera housing (see Section 7, Configuration), you can adjust the camera settings via the camera's on-screen display (OSD) menus. There are two upper-level menus: the **Main** menu and the **Install** menu. The menus have functions that can be selected directly or submenus for more detailed set-up.

– To access the **Main** menu, press the menu/select button (center) for less than 1 second. The **Main** menu appears on the monitor. The **Main** menu allows you to select and set up the picture enhancement functions. If you are not happy with your changes, you can always recall the default values for the mode.
– The camera also has an **Install** menu in which the installation settings can be set. To access the **Install** menu, press the menu/select button (center) for longer than 2 seconds.

7.1.2 Menu navigation

Five keys, located behind the access panel on the back of the camera, are used for navigating through the menu system.

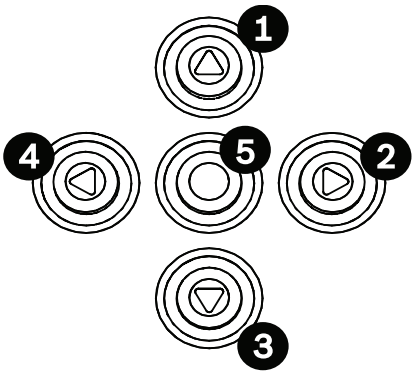

Figure 7.1 Advanced camera setup keypad

Key	Description
1	Up key
2	Right key
3	Down key
4	Left key
5	Menu/Select key

– Use the up or down keys to scroll through a menu.
– Use the left or right keys to move through options or to set parameters.
– When in a menu, quickly double-press the menu/select key to restore the selected item to its factory default.
– To close all menus at once, hold down the menu/select key until the menu display disappears or continually select the **Exit** item.

Some menus close automatically after about two minutes; other menus must be closed manually.

7.2 Pre-defined modes

There are six pre-defined modes with settings to make configuration easier. You can select one of the six pre-defined modes in the Install/Mode submenu. The modes are defined as follows:

1. **24-hour**
   Default installation mode to provide stable pictures over a 24-hour period. These settings are optimized for out-of-the-box installation.
2. **Traffic**
   Capture high-speed objects using default shutter in variable lighting conditions.
3. **Low light**
   Provide extra enhancement such as AGC and SensUp to make usable pictures in low-light conditions.
4. **Smart BLC**
   Settings optimized to capture details in high contrast and extremely bright-dark conditions.
5. **Low noise**
   Enhancements are set to reduce picture noise. Useful for conditional refresh DVR and IP storage systems because reducing noise reduces the amount of storage required.
6. **Infrared**
   Settings are configured to provide optimal imaging performance in low-light or no-light conditions.

7.3 Camera control communication (Bilinx)

This camera is equipped with a coaxial communications transceiver (also referred to as Bilinx). In combination with VP-CFGSFT, the camera setting can be changed from any point along the coaxial cable. All menus can be accessed remotely giving full control of the camera. With this method of communication it is also possible to disable the local keys on the camera. To avoid loss of communication on an installed camera, the **Communication On/Off** selection is not available while using remote control. This function can only be accessed with the camera buttons. Bilinx communications can only be disabled using the buttons on the camera.

Disabled camera buttons

When the Bilinx communications link is active, the buttons on the camera are disabled.

7.4 Main menu structure

Item	Selection	Description
Mode	Submenu	Sets up operating modes 1 to 6
ALC	Submenu	Video level control
Shutter/AGC	Submenu	Shutter and automatic gain control
Day/Night	Submenu	Day/Night for color/mono operation
Illuminator	Submenu	Illuminator intensity and control
Enhance / Dynamic Engine	Submenu	Picture enhancement and performance
Color	Submenu	White balance and color rendition
VMD	Submenu	Video motion detection

7.4.1 Mode submenu

Item	Selection	Description
Mode	1 to 6	Selects operating mode.
Mode ID	Alphanumeric	Mode name (11 characters maximum)
Copy active mode	Available mode numbers	Copies current mode settings to the mode number selected.
Default mode	Submenu	Restores camera to the factory default settings.
EXIT		Returns to main menu.

7.4.2 ALC submenu

Item	Selection	Description
ALC level	-15 to +15	Selects the range within which the ALC will operate. A positive value is more useful for low-light conditions; a negative value is more useful for very bright conditions. Some ALC adjustment may improve scene content when Smart/BLC is enabled.
Peak/average	-15 to +15	Adjusts the balance between peak and average video control. A negative value gives more priority to average light levels; a positive value gives more priority to peak light levels. Video iris lens: select an average level for best results (peak settings may cause oscillations).

Item	Selection	Description
ALC speed	Slow, medium, fast	Adjusts the speed of the video level control loop. For most scenes it should remain at the default value.
DVR/IP Encoder	On, Off	On - The camera output is optimized for connection to a DVR or IP encoder to compensate for compression methods. Off - The camera output is optimized for connection to an analog system (matrix switcher or monitor).
EXIT		Returns to main menu.

7.4.3 Shutter/AGC submenu

Item	Selection	Description
Shutter	AES, FL, Fixed	AES (auto-shutter) - the camera automatically sets the optimum shutter speed. FL - flickerless mode avoids interference from light sources (recommended for video-iris or DC-iris lenses only). FIXED - allows a user defined shutter speed.
Default (AES) shutter or Fixed shutter	1/50 (PAL), 1/60 (NTSC) 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10K	In AES mode, the camera tries to maintain the selected shutter speed as long as the light level of the scene is high enough. In Fixed mode, selects shutter speed.
Actual shutter		Displays the actual shutter value from the camera to help compare lighting levels and optimum shutter speed during set-up.
Gain control	On, Fixed	On - the camera automatically sets the gain to the lowest possible value needed to maintain a good picture. Fixed - sets Fixed AGC value.
Maximum AGC or Fixed AGC	0 to 30 dB	Selects the maximum value that the gain can have during AGC operation. Selects the gain setting for Fixed gain operation (0 is no gain).
Actual AGC		Displays the actual AGC value from the camera to help compare gain level with lighting levels and picture performance.
SensUp Dynamic	Off, 2x, 3x, ..., 10x	Selects the factor by which the sensitivity of the camera is increased. When active, some noise or spots may appear in the picture. This is normal camera behavior. It may also cause motion blur on moving objects.
EXIT		Returns to main menu.

7.4.4 Day/Night submenu

Item	Selection	Description
Day/Night	Auto Video, Auto Photocell, Color, Monochrome	Auto Video - the camera switches the IR cut-off filter on and off depending on the scene illumination level detected by the camera video level. Auto Photocell - the camera switches the IR cut-off filter on and off depending on the ambient light level detected by the photocell. Monochrome - the IR cut-off filter is removed, giving full IR sensitivity. Color - the camera always produces a color signal regardless of light levels.
SW Level	-15 to +15	Sets the video or photocell level in Auto mode at which the camera switches to monochrome operation. A low (negative) value means that the camera switches to monochrome at a lower light level. A high (positive) value means that the camera switches to monochrome at a higher light level.
Priority	Motion, Color	In AUTO mode: Color - the camera gives a color image as long as the light level permits. Motion - the camera avoids motion blur as long as the light level permits (it switches to monochrome earlier than it would with Color priority).
IR contrast	Enhanced, Normal	Enhanced - the camera optimizes contrast in applications with high IR illumination levels. Select this mode for IR (730 to 940 nm) light sources and for scenes with grass and green foliage. Normal - the camera optimizes contrast in mono applications with visible light illumination.
Color burst (mono)	On, Off	Off - the color burst in the video signal is switched Off in monochrome mode. On - the color burst remains active even in monochrome mode (required by some DVRs and IP encoders).
EXIT		Returns to main menu.

7.4.5 Illuminator submenu

Item	Selection	Description
Illuminator	On, Off, Auto	On - the illuminator is always on, regardless of ambient light level. Off - the illuminator remains off, regardless of ambient light level. Auto - the camera switches the illuminator on and off depending on the Day/Night mode.
Intensity	0 to 30	Adjusts the intensity of the illuminator light. The default value is 30.
EXIT		Returns to main menu.

7.4.6 Enhance / Dynamic Engine submenu

Item	Selection	Description
Dynamic Engine	Off, XF-DYN, 2X-DYN*, SmartBLC	Off - turns off all automatic scene detail and enhancements (only recommended for testing). XF-DYN - extra internal processing is enabled for low-light applications (traffic, etc.). 2X-DYN - 2X-Dynamic adds dual sensor exposure to the XF-DYN features. In harsh lighting conditions, pixels from each exposure are mixed to give a more detailed image (use 2X-DYN when SmartBLC is not required). SmartBLC - BLC window and weighting factor are defined automatically. Camera adjusts dynamically for changing light conditions. Includes all the benefits of 2X-DYN.
Autoblack	On, Off	Autoblack On - increases automatically the visibility of details even when scene contrast is less than full-range due to mist, fog, etc.
Black level	-50 to +50	Adjusts the black offset level. A low (negative) value makes the level darker. A high (positive) value makes the level lighter and may bring out more detail in the darker areas.
Sharpness	-15 to +15	Adjusts the sharpness of the picture. 0 corresponds to the default position. A low (negative) value makes the picture less sharp. Increasing sharpness brings out more detail. Extra sharpness can enhance the details of license plates, facial features and the edges of certain surfaces.
Dynamic noise reduction	Auto, Off	In AUTO mode, the camera automatically reduces the noise in the picture. This may cause some motion blur on exceptionally fast moving objects immediately in front of the camera. This can be corrected by widening the field of view or selecting Off.

Item	Selection	Description
Peak White Invert	On, Off	Use Peak White Invert to reduce glare from the CRT/LCD display. Use in ANPR/LPR applications to reduce headlight glare. (Test on-site to ensure that it does benefit the application and is not distracting for operators of the security system.)
EXIT		Returns to main menu.

7.4.7 Color submenu

Item	Selection	Description
White balance	ATW, AWBhold, Manual	ATW - Auto tracking white balance allows the camera to constantly adjust for optimal color reproduction. AWBhold - Puts the ATW on hold and saves the color settings. Manual - the Red, Green, and Blue gain can be set manually to a desired position.
Speed	Fast, Medium, Slow	Adjusts the speed of the white balance control loop.
Red gain	-5 to +5 -50 to +50	ATW and AWBhold - adjusts the Red gain to optimize the white point. Manual - adjusts the Red gain.
Blue gain	-5 to +5 -50 to +50	ATW and AWBhold - adjusts the B gain to optimize the white point. Manual - adjusts the Blue gain.
Green gain	-50 to +50	Manual - adjusts the Green gain.
Saturation	-15 to +5	Adjusts the color saturation. -15 gives a monochrome image.
EXIT		Returns to main menu.

7.4.8 VMD submenu

Item	Selection	Description
VMD	Off, Silent, OSD	Off - Video Motion Detection (VMD) is off. Silent - video motion generates silent alarm. OSD - video motion generates on-screen text message alarm.
VMD area	Submenu	Select to enter the area set-up menu to define the detection area.
Motion indicator		Indicates the peak of measured motion in the selected area. Press either the right, left or center navigation button to reset.
VMD sensitivity		Sets the sensitivity for motion to the desired level. The longer the white bar, the more motion is required to activate the VMD alarm. Motion above this level activates alarm.
OSD alarm text	Alphanumeric	Text for on-screen display alarm (16 characters maximum).
EXIT		Returns to main menu.

Selecting an area for VMD masking

To set up an area for VMD masking, access the area menu by selecting the **VMD Area** option from the VMD menu. Upon entering the **Area** menu, the current area is displayed with the upper left corner flashing. You can move the flashing corner of the image with the Up, Down, Left, Right arrow keys. Press the Select key to move the flashing cursor to the opposite corner, which can now be moved. Press Select again to freeze the area and exit the area menu.

There is one programmable VMD area.

Note:

When VMD is enabled, normal light fluctuations or environmental factors can contribute to false-positive alarms. Because of this, it is recommended that you do **not** connect the VMD-triggered alarm output of the camera to a monitored alarm system as the false-positive alarms may be considered a nuisance.

7.5 Install menu structure

Item	Selection	Description
Lens Wizard	Submenu	Select to optimize the camera-lens combination backfocus point.
Language	Submenu	Select on-screen display (OSD) language
Privacy Masking	Submenu	Sets up a masking area
Synchronization	Submenu	Sets synchronization parameters
Alarm Output	Submenu	Program the alarm output functionality.
Connections	Submenu	Connection parameters
Test Signals	Submenu	Test patterns and texts
Camera ID	Submenu	Select to access ID submenu
Defaults	Submenu	Returns all settings for all modes to factory defaults

7.5.1 Lens Wizard submenu

Item	Selection	Description
Lens type	Auto, Manual, DC-iris, Video	Auto - automatically selects the type of lens. Manual, DC-iris, Video modes - select the matching lens type to force the camera to the correct lens mode.
Detected		Shows the type of lens detected when auto lens detection is used.
Set Backfocus now		Select to fully open the iris. Follow the instructions below for setting the backfocus for your particular lens type. After focusing, the object of interest remains in focus under bright and low light conditions.
Set LVL		Only for video-iris lenses. Adjust the level control on the lens to center the level detector indicator (see below).
EXIT		Returns to Install menu.

7.5.2 Language submenu

Item	Selection	Description
Language	English Spanish French German Portuguese Polish Italian Dutch Russian	Displays the menus on the OSD in the chosen language.
EXIT		Returns to Install menu.

7.5.3 Privacy Masking submenu

Item	Selection	Description
Pattern	Black, Grey, White, Noise	Selects pattern for all masks.
Mask	1, 2, 3, 4	Four different areas can be masked.
Active	On, Off	Turns each of the four masks on or off.
Window	Submenu	Select to open a window in which to define the mask area.

Selecting an area for privacy masking

To set up an area for privacy masking, access the area menu by selecting the **Area** option from the privacy masking menu. Upon entering the **Area** menu, the current area is displayed with the upper left corner flashing. You can move the flashing corner of the image with the Up, Down, Left, Right arrow keys. Press the Select key to move the flashing cursor to the opposite corner, which can now be moved. Press Select again to freeze the area and exit the area menu.

There are four programmable privacy mask areas.

7.5.4 Synchronization submenu

Item	Selection	Description
Synchronization	Internal Line lock	Internal - for free running camera operation. Line lock - to lock to the AC power supply
Horizontal phase	-25 . . 0 . . +25	Adjusts the horizontal phase offset.
Subphase	0, 2 . . . 358	Adjusts the subcarrier phase.
EXIT		Returns to Install menu.

7.5.5 Alarm Output submenu

Item	Selection	Description
Alarm output	VMD, External device, Night mode active, Filter toggle	VMD - output relay closes on VMD alarms. External device - make the output relay available to remote communication devices. Night mode active - output relay closes when camera is in monochrome mode. Filter toggle - output relay closes just before the IR filter starts moving and opens when video level has stabilized (2 to 3 seconds).
EXIT		Returns to Install menu.

7.5.6 Connections submenu

Item	Selection	Description
Notch filter	On, Off	Switches notch filter on or off. The notch filter can remove a Moiré pattern or color artifacts caused by closely spaced vertical lines or objects (for example, vertical security bars over windows).
Bilinx Comms.	On, Off	If Off, Bilinx communications is disabled.
Camera buttons	Enable, disable	Enable or disable the camera buttons from working.
Cable compensation	Off, Default, RG59, RG6, Coax12	Cable compensation is used to avoid the need for amplifiers in long distance coaxial connections up to 1000 m (3000 ft). For optimum results, select the coaxial cable type used or, if unknown, select default.
Compensation level	0,1,2 . . .+15	Sets the level of cable compensation.
EXIT		Returns to Install menu.

7.5.7 Test Signals submenu

Item	Selection	Description
Show camera ID	Off, On	Select On to overlay the camera ID on the video test signal.
Test pattern	Color bars 100%, Grayscale 11-step, Sawtooth 2H, Checker board, Cross hatch, UV plane	Select the desired test pattern to help installation and fault-finding.
EXIT		Returns to Install menu.

7.5.8 Camera ID submenu

Item	Selection	Description
Camera ID		Enter a 17-character camera name. Use Left/Right to change position in the string; use up/down to select character. Use Select to exit.
Display ID pos.	Off, Top left, Top right, Bottom left, Bottom right	Selects the screen position of the camera ID.
Camera ID border	On, Off	Displays a grey border behind the camera ID to make it easier to read.
MAC address		Shows MAC address (factory set, cannot be changed).
Ticker bars	On, Off	The ticker bar moves continuously to show that the image is live and not frozen or played back.
Display mode ID	Off, Top left, Top right, Bottom left, Bottom right	Displays the camera mode in the selected position on the screen.
EXIT		Returns to Install menu.

7.5.9 Defaults submenu

Item	Selection	Description
Restore All	No, Yes	Restores all settings of the six modes to their default (factory) values. Select YES, then press the Menu/Select button to restore all values. When completed, the message RESTORED! appears.

8 Maintenance

8.1 Repairs

DANGER!
Disconnect power before servicing or disassembling the housing or unit.

8.2 Transfer and Disposal

The unit should only be passed-on together with this installation guide. The unit contains environmentally hazardous materials that must be disposed of according to law. Defective or superfluous devices and parts should be disposed of professionally or taken to your local collection point for hazardous materials.

9 Technical Data

VEI-30 Technical Data

Electrical

Model No.	Rated Voltage	Rated Frequency
VEI-308V05-12W	12 VDC/24 VAC (±10%)	50 Hz
VEI-308V05-22W	12 VDC/24 VAC (±10%)	60 Hz
VEI-309V05-12W	12 VDC/24 VAC (±10%)	50 Hz
VEI-309V05-22W	12 VDC/24 VAC (±10%)	60 Hz
Power Consumption		
at 12 VDC		35 W (2.9 A)
at 24 VAC		35 W (1.5 A)
CCD Type		1/3 in. interline, WDR dual shutter

Video

Active Pixels	
PAL Models	752 x 582
NTSC Models	768 x 494
Horizontal Resolution	540 TVL
Signal-to-Noise Ration	> 50 dB
Video Output	Composite Video 1 Vpp, 75 Ohm

Mechanical

Dimensions (H x W x L)	
– Camera and Bracket	402 mm x 193 mm x 310 mm (15.8 in. x 7.6 in. x 12.2 in.)
– Total Assembly	402 mm x 193 mm x 411 mm (15.8 in. x 7.6 in. x 16.2 in.)
Weight	
– Camera and Bracket	6.5 kg (14.3 lbs)
– Junction Box	1.4 kg (3.5 lbs)
Construction	Corrosion-resistant aluminum
Color	RAL 9010 pure white with RAL 9005 jet black detail
Finish	Wet paint
Window	3.3 mm (1/8-in.) thick glass
Bracket	Corrosion-resistant, cable-managed
Bracket Pan/Tilt Range	Pan: ±90° (180° total) Tilt: ±50° (100° total)
Junction Box	Separate from bracket allowing for wiring and cabling (prior to camera installation)

Environmental

Operating Temperature	
– Standard[1]	–40°C to +50°C (–40°F to 122°F)
Storage Temperature	–40°C to +70°C (–40°F to 158°F)
Operating Humidity	20% to 100% (condensing)
Storage Humidity	up to 100%
Wind Load	
– Operational	145 kph (90 mph)
– Non-operational	260 kph (155 mph) – withstand but not operate

1. Warm-up period required for cold start at -40°C (-40°F).

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